PNEAC Factsheet

Plate Developing Pollution Prevention Fact Sheet

Commercial Printing

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Many plate developers are solvent-based, and therefore may be potentially hazardous. Some can be flammable, have a high biological oxygen demand (BOD)[(1)] or very high or low pH. Opportunities to reduce waste from platemaking processes can save money through reduced waste disposal costs. Two ways to prevent pollution from plate developing are:

- Aqueous-based plate developing systems
- Electronic prepress technology

Aqueous Plates

In the late 1970s, plate manufacturers began developing products with water-based chemistries in anticipation of stricter environmental pressures. The goal was to help printers reduce their solvent use, but the technologies were not widely embraced. The first "aqueous" plates were not as durable as solvent plates, had slower exposure times and did not hold a comparable dot.

But aqueous plate systems have come a long way. New technologies and new markets, prompted by increasingly stringent environmental regulations, have guided plate developers back toward aqueous. Water-based plate systems are now of equal Â and in some respects *better*

- Aqueous platemaking processes do not require the use of toxic developers.
- Improvements in the plate's coating have brought aqueous plate systems up to the same level of quality and consistency as solvent systems.
- Aqueous plates cost about the same as solvent-based plates.
- Aqueous plates generally require no procedural changes. Older platemaking equipment designed for solvent-based systems can generally be used with aqueous chemicals and processes.
- Developers are generally less expensive because fewer chemicals are used.
- Replacement of isopropyl alcohol in dampening systems has prompted plate producers to broaden the operating latitude to work with many different types of fountain solutions.
- Cost savings may result from using aqueous plates systems since aqueous chemicals may not be considered hazardous, thereby increasing disposal options.
- Worker safety is enhanced through elimination of employee exposure to toxic chemicals.

Aqueous platemaking processes use specially formulated presensitized aluminum plates. It is important that presensitized plates and aqueous developers come from the same manufacturer. Some other factors to consider before switching to aqueous plate systems:

- Aqueous process chemicals must be very clean to maintain plate quality.
- Aqueous chemical life can be up to 20% shorter than solvent-based chemicals.

Chemical changeout must be performed more often than with traditional solvent-based systems.

Electronic Technology

Enormous advances have been made in electronic prepress technology in recent years. Many printers have invested in electronic technology as a supplement or a substitute for traditional computer graphic typesetting. Primary advantages of electronic prepress (also known as desktop publishing) include speed, reduced prepress costs associated with traditional methods, labor savings, reduced editing time and the creative flexibility to integrate many images.

But electronic prepress technology can cost a lot initially (starting at around $30,000) for computer hardware and software, scanners and digital cameras. Employee training is usually necessary as well.

Another emerging (albeit expensive) technology is direct-to-plate, which enables the printer to image a computer-generated design directly to the plate. Digital plate quality often surpasses film-based technology because there is no image degradation from film contact with the plate. While this technology is not usually feasible for small printers, it is worth a brief discussion here because its acceptance and affordability will likely increase in the next few years. Direct-to-plate technology offers some of the following advantages:

- Reduced material costs by eliminating film and processing
- Prepress waste eliminated Â a reduction in paper waste and film and processing chemistry
- Short runs become cost-effective
- Decreased labor costs from stripping and platemaking since customers supply jobs on disks
- Reduced makeready times and reduced waste generation by eliminating defective plates caused by misregistration, dust, contact and vacuum problems

Digital proofing is also gaining acceptance among printers. While traditional proofs provide a very true look at film quality (revealing scratches and blemishes, for instance) and are particularly effective for fine printed works, they are labor intensive and use many expensive materials.

Digital proofs offer new ways to save time and money in the prepress stage. For short runs, where customers don't want to spend a lot of money on a proof, and for jobs that require potentially many changes or iterations, digital proofing is usually cost-effective. In addition, there is the opportunity for quick turnaround in remote proofing, since electronic files can be printed out at the customer's site.

Another steadily advancing technology is "soft proofing," the concept of proofing on the screen, with no hard proof. Soft proofs are more capable today of representing the true color of the final print job, and increasingly what you see on the screen really *is* what you get. Because proofs are expensive, many printers can work with customers to edit jobs on the screen, making necessary revisions before making a proof. Soft proofing can save printers money by reducing prepress waste and cutting labor costs.

Vendors and Suppliers

Indication herein of specific vendors and suppliers does not imply endorsement, nor does omission imply a refutation by the Montana State University Extension Service Pollution Prevention Program.

Desktop Publishing

- Adobe Systems Inc. (415)961-4400
- Aldus Corporation (206)628-2320
- Quark, Inc. (303)894-8888
- Ventura (800)822-8221

Aqueous and Two-Sided Plates

Polychrome Americas
11900 Durrington Drive
Richmond, VA 23236
(800)638-4463

Polychrome Americas (corporate)
222 Bridge Plaza South
Fort Lee, NJ 07024
(800)285-7659

Sources:

Cross, L. "Litho Plate Technology Meets Productivity, Eco-Challenges," *Graphic Arts Monthly*, June 1993, p. 37.

Cross, L. "Litho Plates Get Eco-Friendly," *Graphic Arts Monthly*, May 1993, p. 68-72.

Environmental Management and Pollution Prevention: A Guide for Lithographic Printers, Washington Department of Ecology, September, 1994.

Hannaford, S. "Digital Proofing Gains Acceptance," *Color Publishing*, May/June 1994, p. 12-17.

Hevenor, K. "The Softer Side of Printing," *Color Publishing*, May/June 1994, p. 45-46.

Pollution Prevention Manual for Lithographic Printers, Iowa Waste Reduction Center, 1995.

Pope, D. "Digital Presses: Behind the Scenes and Beyond the Hype," *Color Publishing*, March/April 1994, p. 15-22.

Roth, J. "Prepress update: Digital Presses Make Short-Run Color Profitable," *Printing Manager*, January/February 1994, p. 14.

Ulbrecht, A. & Watts, D.J. *Environmental Research Brief: Waste Reduction Activities and Options for a Printing Plate Preparation Section of a Newspaper*, Environmental Protection Agency, October 1992.

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1. Biological oxygen demand is the amount of dissolved oxygen needed by aerobic decomposers to break down organic materials in water at a given volume, temperature and time period. High BOD content can kill fish in rivers and lakes.

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